

## **GILA RIVER AT 116TH AVENUE FCD GAGE ID #6848**

**LOCATION** – The gage is located in the Gila River on the downstream side of the center pier of the 116th Avenue bridge. The transmitter is located in a metal box on a platform in the center of the bridge directly above the PT. The gage location is immediately below the confluence of the Salt and Gila Rivers. Latitude N33° 23' 24"; Longitude W112° 18' 28". Located in the NW1/4 NW1/4 SE1/4 S36 T1N R1W in the Tolleson 7.5-minute quadrangle.

**ESTABLISHMENT** – January 21, 1999

**DRAINAGE AREA** – about 43,300 square miles

**GAGE** – The gage is a pressure transducer type instrument located on the downstream side of the bridge on the center (9th) pier. The PT elevation is at 928.29 feet M.S.L. or 1.15 feet gage height. Gage height is based on RM 1 as 0.00 feet, or 927.14 feet MSL, levels of January 4, 1999, located just below the PT conduit on the downstream side of the pier.

There are no known staff gages at this location. Newly added painted staff gages have not been surveyed and tied to gage height.

There are no crest-stage gages at this location.

**ZERO GAGE HEIGHT** - Zero gage height is defined as RM1, as described below. It is at 927.14 feet M.S.L.

**HISTORY** – No previous history at this location. From November 7, 1997 to October 14, 1998 a gage was located on 115th Avenue at the culverts passing beneath 115th Avenue. That gage was removed following completion of the new 116th Ave. bridge. Gaging equipment was installed on the bridge in December 1998 and January 1999.

### **REFERENCE MARKS** –

ERM48: Elevation 930.75 feet M.S.L., gage height 3.61 feet. Brass cap in hand hole in center of 115th Avenue.

RM 1 -- Elevation 927.14 ft MSL, 0.0 ft gage height is a chiseled "X" in the concrete below the PT conduit at the base of the pier beneath the instrument box.

RM 2 -- Elevation 927.96 ft MSL, 0.82 ft gage height is the top of a piece of rebar extending from the base of the pier at the PT on the North (right) upstream side of the pier.

RM 3 -- Elevation 928.02 ft MSL, 0.88 ft gage height is the top of the rebar on the same pier as RM 1 and 2 on the South (left) upstream side of the pier.

RP1: Elevation 930.74 feet M.S.L., gage height 3.60 feet. "X" chiseled into upstream south side of culvert headwall.

**CHANNEL AND CONTROL** – This location is just downstream from the confluence of the Salt and Gila Rivers. The river is heavily vegetated with willow, salt cedar, and other large plant material.

There are levees on both the left and right banks of the channel. Control for the channel is influenced by the vegetation. At low flows, a small low flow channel conveys flow. Outside of the low flow channel and until the entire channel is flowing, exact control is unknown.

**RATING** – The rating, Rating No. 1, is from an HEC-RAS analysis of the channel downstream from the bridge. Discharges are only given in Rating No. 1 up to 100,000 cfs. Somewhere above 100,000 cfs flow begins to flow around the levee in the right bank upstream of the levee. Also, channel roughness is probably underestimated in the multiple profile run used in Rating No. 1 as the RAS model was for the 100-year event. Finally, changes in roughness due to vegetation growth may greatly affect the stage-discharge relation at this station. It is recommended that comparisons be made with SRP release estimates and the USGS Gila River @ Estrella Parkway station to refine the rating at this site.

**DISCHARGE MEASUREMENTS** – Bridge measurements are possible but would require a long time and muscle power to winch the weight up and down. It is probably satisfactory to use data from SRP releases and USGS data at Estrella Parkway to refine the rating at this site.

**POINT OF ZERO FLOW** – Undetermined

**FLOODS** – None recorded by the gage. However, there have been a number of historic high flow events on the Salt and Gila Rivers. The largest flood of record was in 1891 when approximately 300,000 cfs flowed in from the Salt River.

**ACCURACY** – Poor until stage measurements can be obtained for known discharges from SRP releases and Salt River @ Priest and Gila @ Estrella Parkway gage data.

**DIVERSIONS** - Diversions occur from Granite Reef Dam on the Salt River and from Coolidge Dam on the Gila River. Diversions are used for municipal and agricultural purposes.

**REGULATION** - Four dams on the Salt River, two dams on the Verde River and at least one dam on the Gila River heavily regulate natural flows in the watershed above this gage location. Small, routine flows in the Gila River at this location are due mainly to irrigation return and effluent from wastewater treatment. Major flows are due mainly to heavy snowfall followed by rainfall producing significant runoff that cannot be contained by the upstream dams.

**JUSTIFICATION** – Monitor flows in the Gila River for flood warning of Holly Acres area levee. The FIS topographic maps indicate that flow begins around the Holly Acres levee at around 944 ft MSL upstream of the bridge.

**UPDATE** -        July 18, 2011  
                         DE Gardner